



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/079,003	02/20/2002	Peter Haug	1376-01	6145

35811 7590 07/01/2005

IP GROUP OF DLA PIPER RUDNICK GRAY CARY US LLP  
1650 MARKET ST  
SUITE 4900  
PHILADELPHIA, PA 19103

EXAMINER
----------

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/079,003

Applicant(s)

HAUG ET AL.

Examiner

Raymond Alejandro

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,2 and 4-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

Art Unit: 1745

## DETAILED ACTION

### *Response to Amendment*

This action is responsive to the amendment filed on 06/02/05. The applicant has overcome the 35 USC 103 rejections. Refer to the aforesaid amendment for specific details on applicant's rebuttal arguments. However, the present claims (including newly added claim 12) are rejected again over new art as seen infra. Thus, the rejection is being made final for the reasons of record.

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-2 and 7-8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/327255 in view of Kobayashi et al 4821148. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

This is a provisional obviousness-type double patenting rejection.

The copending application'255 claims the following (CLAIMS 1-2):

Art Unit: 1745

1. A galvanic element having a thin, flat and flexible metallic housing, wherein the housing comprises:

a foil fabricated from a copper material having a copper content of at least about 95% by weight and a light-metal alloying additive, where the copper and alloying light metal differ in atomic number by at least 15, but no more than 26, and have melting points that differ by at least about 400° C., but no more than about 950° C., and wherein the alloying metal is monovalent to trivalent in compounds and modifies face-centered cubic hard-sphere packing of the copper during alloying such that its mass density of about 8.94 g/cm<sup>3</sup> is altered by at least about 0.03 g/cm<sup>3</sup>, and

an adhesive coating on a side of the foil facing an interior portion of the housing.

2. The galvanic element according to claim 1, wherein said adhesive coating comprises electrochemically deposited copper crystallites.

*In this instance, the application claims are broader or more generic than the copending application claims, thus, the application claims are anticipated by the copending application claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. In re Goodman. In addition, the combination of claims 1-2 represents an obvious modification of the claimed subject matter; in fact, claim 2 additionally and positively claims and encompasses all of the limitations of claim 1, and therefore, it encompasses the presently claimed invention.*

In addition, the copending application'255 does not expressly disclose or claim the specific benzotriazole corrosion layer.

Kobayashi et al discloses a silver electrode on a lead frame bonded to an aluminum electrode on a chip with a copper wire (*the galvanic element per se: the entire structure*) wherein an Ag-benzotriazole film 6 was formed on the surface of the silver electrode 4 and a Cu-benzotriazole film 7 was formed on the surface of the copper wire 3, while an Ag-benzotriazole film 8 was formed on the surface of the aluminum electrode 5 (ABSTRACT).

Art Unit: 1745

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of Kobayashi et al in the galvanic element of the copending application'255 as Kobayashi et al clearly stipulate that such coated electrodes or coated components are effectively protected by the anticorrosive benzotriazole-based films and they exhibit excellent damp-proof.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1-2 and 7-8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/327255 in view of the Japanese publication JP 56-19863 (herein called "*the JP'863 publication*"). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

This is a provisional obviousness-type double patenting rejection.

The copending application'255 claims the following (CLAIMS 1-2):

Art Unit: 1745

1. A galvanic element having a thin, flat and flexible metallic housing, wherein the housing comprises:

a foil fabricated from a copper material having a copper content of at least about 95% by weight and a light-metal alloying additive, where the copper and alloying light metal differ in atomic number by at least 15, but no more than 26, and have melting points that differ by at least about 400° C., but no more than about 950° C., and wherein the alloying metal is monovalent to trivalent in compounds and modifies face-centered cubic hard-sphere packing of the copper during alloying such that its mass density of about 8.94 g/cm<sup>3</sup> is altered by at least about 0.03 g/cm<sup>3</sup>, and

an adhesive coating on a side of the foil facing an interior portion of the housing.

2. The galvanic element according to claim 1, wherein said adhesive coating comprises electrochemically deposited copper crystallites.

*In this instance, the application claims are broader or more generic than the copending application claims, thus, the application claims are anticipated by the copending application claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. In re Goodman. In addition, the combination of claims 1-2 represents an obvious modification of the claimed subject matter; in fact, claim 2 additionally and positively claims and encompasses all of the limitations of claim 1, and therefore, it encompasses the presently claimed invention.*

In addition, the copending application'255 does not expressly disclose or claim the specific benzotriazole corrosion layer.

The JP'863 publication teaches an alkaline battery having a copper alloy plate cathodic collector including a coating of a benzotriazole on the surface of the cathodic collector (See ABSTRACT).

In light of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the specific benzotriazole coating of the JP'863

Art Unit: 1745

publication in the galvanic element of the copending application'255 as the JP'863 publication discloses that such benzotriazole layer has good adhesion to the Cu-plate to give improved liquid leakage characteristics, that is, the water repellent effect was effective to further prevent liquid leakage. It also improves chemical activity thereof.

4. Claims 1-2 and 7-8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/327255 in view of the Japanese publication JP 61-56286 (hereinafter referred to as "*the JP'286 publication*"). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

This is a provisional obviousness-type double patenting rejection.

The copending application'255 claims the following (CLAIMS 1-2):

1. A galvanic element having a thin, flat and flexible metallic housing, wherein the housing comprises:

a foil fabricated from a copper material having a copper content of at least about 95% by weight and a light-metal alloying additive, where the copper and alloying light metal differ in atomic number by at least 15, but no more than 26, and have melting points that differ by at least about 400° C., but no more than about 950° C., and wherein the alloying metal is monovalent to trivalent in compounds and modifies face-centered cubic hard-sphere packing of the copper during alloying such that its mass density of about 8.94 g/cm<sup>3</sup> is altered by at least about 0.03 g/cm<sup>3</sup>, and

an adhesive coating on a side of the foil facing an interior portion of the housing.

2. The galvanic element according to claim 1, wherein said adhesive coating comprises electrochemically deposited copper crystallites

*In this instance, the application claims are broader or more generic than the copending application claims, thus, the application claims are anticipated by the copending application*

Art Unit: 1745

*claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. In re Goodman. In addition, the combination of claims 1-2 represents an obvious modification of the claimed subject matter; in fact, claim 2 additionally and positively claims and encompasses all of the limitations of claim 1, and therefore, it encompasses the presently claimed invention.*

In addition, the copending application'255 does not expressly disclose or claim the specific benzotriazole corrosion layer.

The JP'286 publication reveals that surface finishing for a cathode plate of an alkali cell is effected by further applying a surface protection layer containing benzotriazole (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of the JP'286 publication in the galvanic element of the copending application'255 as the JP'286 publication discloses that such layer provides surface protection of the cathode plate. Thus, the surface finishing of the cathode plate is enhanced.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various



Art Unit: 1745

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Itoh et al 5024905, and further in view of Kobayashi et al 4821148.

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

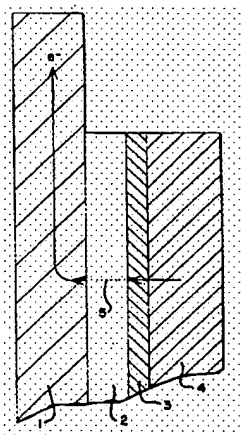
Regarding claim 1:

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20).

Art Unit: 1745

Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrate the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1*); and the electrochemically deposited polymer layer 4.



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Art Unit: 1745

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Art Unit: 1745

Itoh et al disclose a platinum alloy electrocatalyst having high activity and a long life comprising an electrically conductive carrier and dispersed in, and deposited on it, a platinum-iron-cobalt-copper quaternary ordered alloy having a specified composition (ABSTRACT). In particular, it is disclosed that the electrode has a Cu-containing alloy deposited thereon (CLAIMS 17-18). *Thus, Itoh et al at once envisage the deposition of crystallites of a Cu-containing alloy on surface of the electrode. It is noted that the electrode per se satisfies the requirement of being a galvanic element.*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Itoh et al in the galvanic element of Bittihn et al because Itoh et al disclose that such specific electrochemically deposited crystallite material provides an electrode having high activity, a long life and suitable electrical conduction. *Furthermore, the examiner wishes to point out that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Itoh et al directly teach an electrode containing such Cu-deposited crystallites, thus, the electrode act as the claimed galvanic element. As a consequence, Itoh et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Itoh et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned.

Art Unit: 1745

*As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

In addition, neither Bittihn et al nor Itoh et al expressly disclose the specific benzotriazole corrosion layer.

Kobayashi et al discloses a silver electrode on a lead frame bonded to an aluminum electrode on a chip with a copper wire (*the galvanic element per se: the entire structure*) wherein an Ag-benzotriazole film 6 was formed on the surface of the silver electrode 4 and a Cu-benzotriazole film 7 was formed on the surface of the copper wire 3, while an Ag-benzotriazole film 8 was formed on the surface of the aluminum electrode 5 (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of Kobayashi et al in the galvanic element of Bittihn et al and Itoh et al as Kobayashi et al clearly stipulate that such coated electrodes or coated components are effectively protected by the anticorrosive benzotriazole-based films and they exhibit excellent damp-proof.

Art Unit: 1745

8. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Itoh et al 5024905 and further in view of the Japanese publication JP 56-19863 (herein called "*the JP '863 publication*").

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

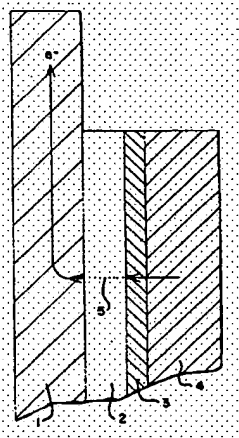
Regarding claim 1:

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20). Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrate the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural*

Art Unit: 1745

oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1); and the electrochemically deposited polymer layer 4.



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Art Unit: 1745

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Itoh et al disclose a platinum alloy electrocatalyst having high activity and a long life comprising an electrically conductive carrier and dispersed in, and deposited on it, a platinum-iron-cobalt-copper quaternary ordered alloy having a specified composition (ABSTRACT). In particular, it is disclosed that the electrode has a Cu-containing alloy deposited thereon (CLAIMS 17-18). *Thus, Itoh et al at once envisage the deposition of crystallites of a Cu-*



Art Unit: 1745

*containing alloy on surface of the electrode. It is noted that the electrode per se satisfies the requirement of being a galvanic element.*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Itoh et al in the galvanic element of Bittihn et al because Itoh et al disclose that such specific electrochemically deposited crystallite material provides an electrode having high activity, a long life and suitable electrical conduction. *Furthermore, the examiner wishes to point out that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Itoh et al directly teach an electrode containing such Cu-deposited crystallites, thus, the electrode act as the claimed galvanic element. As a consequence, Itoh et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Itoh et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

Art Unit: 1745

In addition, neither Bittihn et al nor Itoh et al expressly disclose the specific benzotriazole corrosion layer.

The JP'863 publication teaches an alkaline battery having a copper alloy plate cathodic collector including a coating of a benzotriazole on the surface of the cathodic collector (See ABSTRACT).

In light of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the specific benzotriazole coating of the JP'863 publication in the galvanic element of Bittihn et al and Itoh et al as the JP'863 publication discloses that such benzotriazole layer has good adhesion to the Cu-plate to give improved liquid leakage characteristics, that is, the water repellent effect was effective to further prevent liquid leakage. It also improves chemical activity thereof.

9. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Itoh et al 5024905, and further in view of the Japanese publication JP 61-56286 (hereinafter referred to as "*the JP '286 publication*").

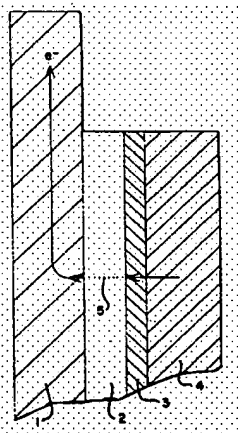
The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

Regarding claim 1:

Art Unit: 1745

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20). Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrate the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1*); and the electrochemically deposited polymer layer 4.



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic,

Art Unit: 1745

*function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.*

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Art Unit: 1745

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Itoh et al disclose a platinum alloy electrocatalyst having high activity and a long life comprising an electrically conductive carrier and dispersed in, and deposited on it, a platinum-iron-cobalt-copper quaternary ordered alloy having a specified composition (ABSTRACT). In particular, it is disclosed that the electrode has a Cu-containing alloy deposited thereon (CLAIMS 17-18). *Thus, Itoh et al at once envisage the deposition of crystallites of a Cu-containing alloy on surface of the electrode. It is noted that the electrode per se satisfies the requirement of being a galvanic element.*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Itoh et al in the galvanic element of Bittihn et al because Itoh et al disclose that such specific electrochemically deposited crystallite material provides an electrode having high activity, a long life and suitable electrical conduction. *Furthermore, the examiner wishes to point out that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art*

Art Unit: 1745

*element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Itoh et al directly teach an electrode containing such Cu-deposited crystallites, thus, the electrode act as the claimed galvanic element. As a consequence, Itoh et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Itoh et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

In addition, neither Bittihn et al nor Itoh et al expressly disclose the specific benzotriazole corrosion layer.

The JP'286 publication reveals that surface finishing for a cathode plate of an alkali cell is effected by further applying a surface protection layer containing benzotriazole (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of the JP'286 publication in the galvanic element of Bittihn et al and Itoh et al as the JP'286 publication discloses that such layer provides surface protection of the cathode plate. Thus, the surface finishing of the cathode plate is enhanced.

Art Unit: 1745

10. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Maxfield et al 5120707 and further in view of Kobayashi et al 4821148.

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

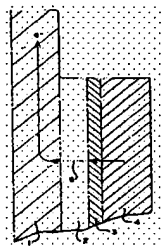
Regarding claim 1:

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20). Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrates the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural*

Art Unit: 1745

*oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1); and the electrochemically deposited polymer layer 4.*



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-



Art Unit: 1745

nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Maxfield et al disclose superconducting elements by electrodeposition of metals with embedment of particulate matter (TITLE). Maxfield et al disclose that the superconducting ceramic layers are made by first electrochemically depositing metal layers containing embedded particulate matter to form the desired superconducting material (ABSTRACT). In particular, EXAMPLE XIII shows a superconducting film comprised of oriented crystallites being formed from a precursor prepared by the electrochemical deposition of Cu, among other elements, onto a substrate (EXAMPLE XIII or COL 21, lines 1-15). *Thus, Maxfield et al also envisage the electrochemical deposition of Cu crystallites on surface of a substrate to form a superconducting*

Art Unit: 1745

*article. For that reason, the superconducting article for itself fulfills the requisite galvanic characteristic (i.e. the galvanic element).*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Maxfield et al in the galvanic element of Bittihn et al because Maxfield et al disclose that such specific electrochemically deposited crystallite material improves both the electrical and mechanical properties of the superconducting layer being formed on the element. *Furthermore, the examiner additionally points that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Maxfield et al directly teach a substrate having electrochemically deposited thereon crystallites of Cu, thus, the superconducting element acts as the claimed galvanic element. As a consequence, Maxfield et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Maxfield et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

Art Unit: 1745

In addition, none of the two preceding references expressly disclose the specific benzotriazole corrosion layer.

Kobayashi et al discloses a silver electrode on a lead frame bonded to an aluminum electrode on a chip with a copper wire (*the galvanic element per se: the entire structure*) wherein an Ag-benzotriazole film 6 was formed on the surface of the silver electrode 4 and a Cu-benzotriazole film 7 was formed on the surface of the copper wire 3, while an Ag-benzotriazole film 8 was formed on the surface of the aluminum electrode 5 (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of Kobayashi et al in the galvanic element of Bittihn et al and Maxfield et al as Kobayashi et al clearly stipulate that such coated electrodes or coated components are effectively protected by the anticorrosive benzotriazole-based films and they exhibit excellent damp-proof.

11. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Maxfield et al 5120707 and further in view of the Japanese publication 56-19863 (herein called "*the JP'863 publication*").

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

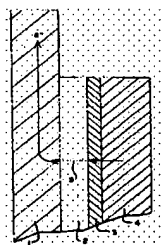
Regarding claim 1:

Art Unit: 1745

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20).

Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrates the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1*); and the electrochemically deposited polymer layer 4.



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Art Unit: 1745

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Art Unit: 1745

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Maxfield et al disclose superconducting elements by electrodeposition of metals with embedment of particulate matter (TITLE). Maxfield et al disclose that the superconducting ceramic layers are made by first electrochemically depositing metal layers containing embedded particulate matter to form the desired superconducting material (ABSTRACT). In particular, EXAMPLE XIII shows a superconducting film comprised of oriented crystallites being formed from a precursor prepared by the electrochemical deposition of Cu, among other elements, onto a substrate (EXAMPLE XIII or COL 21, lines 1-15). *Thus, Maxfield et al also envisage the electrochemical deposition of Cu crystallites on surface of a substrate to form a superconducting article. For that reason, the superconducting article for itself fulfills the requisite galvanic characteristic (i.e. the galvanic element).*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Maxfield et al in the galvanic element of Bittihn et al because Maxfield et al disclose that such specific electrochemically deposited crystallite material improves both the electrical and mechanical properties of the superconducting layer being formed on the element. *Furthermore, the examiner additionally points that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the*

Art Unit: 1745

*same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Maxfield et al directly teach a substrate having electrochemically deposited thereon crystallites of Cu, thus, the superconducting element acts as the claimed galvanic element. As a consequence, Maxfield et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Maxfield et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

In addition, none of the two preceding references expressly disclose the specific benzotriazole corrosion layer.

The JP'863 publication teaches an alkaline battery having a copper alloy plate cathodic collector including a coating of a benzotriazole on the surface of the cathodic collector (See ABSTRACT).

In light of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the specific benzotriazole coating of the JP'863 publication in the galvanic element of Bittihn et al and Maxfield et al as the JP'863 publication discloses that such benzotriazole layer has good adhesion to the Cu-plate to give improved liquid

Art Unit: 1745

leakage characteristics, that is, the water repellent effect was effective to further prevent liquid leakage. It also improves chemical activity thereof.

12. Claims 1-2, 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Maxfield et al 5120707 and further in view of the Japanese publication 61-56286 (herein called "*the JP '286 publication*").

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

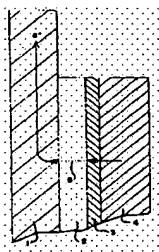
Regarding claim 1:

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20).

Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).



The Figure below illustrates the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1*); and the electrochemically deposited polymer layer 4.



Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Art Unit: 1745

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

As for claim 12:

Bittihn et al disclose the inclusion of the electroconducting coating made of a metal selected from Ni, Cr or a Cr-Ni alloy (CLAIM 2).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the electrochemically deposited crystallites of Cu and/or alloy thereof.

Maxfield et al disclose superconducting elements by electrodeposition of metals with embedment of particulate matter (TITLE). Maxfield et al disclose that the superconducting ceramic layers are made by first electrochemically depositing metal layers containing embedded particulate matter to form the desired superconducting material (ABSTRACT). In particular, EXAMPLE XIII shows a superconducting film comprised of oriented crystallites being formed from a precursor prepared by the electrochemical deposition of Cu, among other elements, onto a

Art Unit: 1745

substrate (EXAMPLE XIII or COL 21, lines 1-15). *Thus, Maxfield et al also envisage the electrochemical deposition of Cu crystallites on surface of a substrate to form a superconducting article. For that reason, the superconducting article for itself fulfills the requisite galvanic characteristic (i.e. the galvanic element).*

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to electrochemically deposit crystallites of Cu and/or alloy thereof of Maxfield et al in the galvanic element of Bittihn et al because Maxfield et al disclose that such specific electrochemically deposited crystallite material improves both the electrical and mechanical properties of the superconducting layer being formed on the element. *Furthermore, the examiner additionally points that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Maxfield et al directly teach a substrate having electrochemically deposited thereon crystallites of Cu, thus, the superconducting element acts as the claimed galvanic element. As a consequence, Maxfield et al do contemplate galvanic elements having the claimed metal crystallite deposited thereon. In this manner, the examiner strenuously asserts that the applied art (Bittihn et al and Maxfield et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to*

Art Unit: 1745

*conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

In addition, none of the two preceding references expressly disclose the specific benzotriazole corrosion layer.

The JP'286 publication reveals that surface finishing for a cathode plate of an alkali cell is effected by further applying a surface protection layer containing benzotriazole (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific benzotriazole corrosion layer of the JP'286 publication in the galvanic element of Bittihn et al and Maxfield et al as the JP'286 publication discloses that such layer provides surface protection of the cathode plate. Thus, the surface finishing of the cathode plate is enhanced.

13. Claims 4-6 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) the combination of Bittihn et al 5047302-Itoh et al 5024905-Kobayashi et al 4821148; and/or b) the combination of Bittihn et al 5047302-Itoh et al 5024905-the Japanese publication 56-19863; and/or c) the combination of Bittihn et al 5047302-Itoh et al 5024905-the Japanese publication 61-56286; and/or d) the combination of Bittihn et al 5047302-Maxfield et al 5120707-Kobayashi et al 4821148; and/or e) the combination of Bittihn et al 5047302-Maxfield et al 5120707- the Japanese publication 56-19863; and/or f) the combination of Bittihn et al 5047302-Maxfield et al 5120707- the Japanese publication 61-56286, as applied to claim 1 above, and further in view of Nakanishi et al US 2002/0142211.

Art Unit: 1745

Bittihn et al'302, Itoh et al'905, Kobayashi et al'148, Maxfield et al'707, the JP'863 publication, the JP'286 publication are collectively applied, argued and incorporated herein for the reasons above. However, the preceding prior art does not expressly disclose the specific size of the crystallites and the specific thickness of the metallic conductor.

Regarding claim 4 and 11:

**Table 1** and **Table 3** shows invention cells 1 and 12 wherein the thickness of the Ni layer is 0.02 mm (or 20 Tm) (SECTION 0126 & 0128 or Table 1 and 3).

As for claims 5-6:

It is disclosed that the copper current collector has a thickness of 20 Tm (SECTION 0161, 0184).

*Examiner's note: it is noted that Nakanishi et al's teaching of having the negative electrode current collector comprising a plurality of layers has been interpreted to apply to both the coated current collector of the negative electrode and the current collector plate per se (i.e. the current collecting structure) as they both are made from substantially the same material and have also substantially similar functionality of collecting current therethrough.*

Concerning claim 12:

Nakanishi et al disclose that the metal for forming the metal layer of the negative electrode current collector is for example, nickel, titanium or chromium (SECTION 0034).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific size of the crystallites and the specific thickness of the galvanic element (metallic conductor) of the collective combination of Bittihn et al'302, Itoh et al'905, Kobayashi et al'148, Maxfield et al'707, the JP'863 publication, the JP'286 publication

Art Unit: 1745

as taught by Nakanishi et al because Nakanishi et al teach such specific dimension provides suitable electrochemical contact, mechanical stability and structural conformity. *In this case, this disclosure is found to be within the same field of endeavor of the preceding prior art and, thus, relevant to each other because Nakanishi et al is concerned with providing metallic galvanic elements (their current collectors) having a plurality of layers characterized by having different metal layers deposited one over another. As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

#### ***Response to Arguments***

14. Applicant's arguments with respect to claims 1-2 and 4-12 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

Art Unit: 1745

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro  
Primary Examiner  
Art Unit 1745

  
**RAYMOND ALEJANDRO**  
**PRIMARY EXAMINER**